

STUDIES IN THE XYLARIACEAE

II. ROSELLINIA AND THE PRIMO CINEREA SECTION OF HYPOXYLON

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The genus *Rosellinia* DN has been the subject of considerable misinterpretation since its inception in 1884 by De Notaris. Based on *R. aquila*, it was subsequently made to include a large number of globose pyrenomycetes, some of which had a true stroma as in the type species, and some which merely consisted of one or a few perithecia under a thin hyphal covering. The presence of the entostroma enclosing the perithecium was not truly recognized in the former until Miller's review in 1928 (pp. 191, 326), and even he did not apparently realize that there was no essential difference between many species of *Rosellinia* and the members of his sub-section Primocinerea of *Hypoxylon* (1961, p. 57).

Saccardo (1882) divided the genus into 10 sections:

- | | |
|---------------------|---|
| (1) Eurosellinia | Perithecia large, glabrous, with basal subiculum. |
| (2) Calomastia | Perithecia fairly large, glabrous, subiculum absent. |
| (3) Tassiella | Perithecia fairly large, but without setae. |
| (4) Amphisphaerella | Perithecia sunken basally into the substrate as in <i>Anthostomella</i> . |
| (5) Coniomela | Perithecia small, glabrous, often densely gregarious. |
| (6) Coniochaeta | Perithecia small, setose, often gregarious. |
| (7) Cucurbitula | Perithecia caespitose and erumpent. |
| (8) Lichenicolae | Inhabiting lichens. |
| (9) Sphaeropyxis | Perithecia shortly stipitate, spores globose. |
| (10) Desciscentes | Miscellaneous and ill defined. |

The lack of uniformity of the characters selected makes the division unworkable. Kirschstein (1933, p. 403) later recognized that these subgroups belonged to different families of the Sphaeriales, and placed them in four families: Trichosphaeriaceae, Melanommaceae, Amphisphaeriaceae, and Cucurbitariaceae. Three subgroups, *Coniomela*, *Amphisphaerella*, and *Cucurbitula*, were given generic rank, and another subgroup, *Coniochaeta*, was merged with *Helminthosphaeria* (Trichosphaeriaceae). *Coniomela* and *Rosellinia* (emended) were placed in the Melanommaceae.

While the other genera were no doubt correctly placed, there was no demon-

trable affinity shown between *Rosellinia* as emended and the other Melanomma-ceae. There is a definite outer crust, which is usually carbonaceous, protecting the membranous perithecium and the perithecia are often separated from the substrate by a corky layer beneath (Plate I, 1). The spores are one celled while spores of the Melanomma-ceae typically have one or more septae.

The *Primocinerea* subsection of *Hypoxylon*. Miller (1961) established two subsections in his section Papillata, based primarily on the papillate or conic nature of the ostioles: one (*Primocinerea*), including species which remained grey or dark at maturity and did not develop pigment, and the other (*Papillata*) including those which were coloured at least during development. The present writer has found this difference to be augmented in that the germ slit usually occurs on the flat or concave side of those spores which are inequilateral in the species of the non-coloured group, while the reverse is true of the coloured section. On the other hand special significance should be attached to the *absence* rather than presence of papillate ostioles since the latter occur in the majority of the Xylariaceae as a whole, and one section (*Euhypoxylon*) out of the four sections of the genus *Hypoxylon* originally established by Miller (1961) is rightly distinguished by its umbilicate nature. Logically, similar stress ought to be placed on the *absence* of coloured pigment in the outer stroma, since a pigment can be demonstrated in all species of *Hypoxylon* but in the *Primocinerea* group. Thus there appears to be good reason to dissociate Miller's two subsections.

Furthermore the affinity of the subsection *Primocinerea* with *Rosellinia* seems clear for the following reasons:

- (1) The stromata vary from uni- to multiperitheciate, often within the same sample. This feature has been admitted several times in the literature but has not been recognized in classification. Three other species groups of *Hypoxylon* (*Papillata*, *Annulata*, *Euhypoxylon*) share this feature, but its general occurrence in the rest of the Xylariaceae is limited. (Plate I: 3-7).
- (2) The structure of the stroma is relatively uniform. The ectostroma forms a soft superficial veneer while the entostroma is divided into a prominent black carbonaceous shield and a basal corky layer that is invariably lighter in colour, although in many cases feebly developed. (Plate I: 2).
- (3) The ascial plugs are of the cubicular-rectangular variety, while in the other groups of *Hypoxylon* they are discoid or flattened. (Plate II: 1-5).
- (4) The spores, if inequilateral, usually bear the germ slit on the least convex surface. (Plate II: 1).

- (5) The hyaline sheath on the spore is conspicuous in many cases, while it is never so in other groups of *Hypoxylon*.
- (6) The imperfect stages known for a large representative sample of the species conform to the genus *Nodulisporium* which was described in the previous paper. This furnishes important additional evidence that the group is a natural one. See Plate II: 6 and 7.

In addition the following species from other groups are considered to belong here for the same reasons:

Species	Group or Genus where formerly placed
<i>Hypoxylon chrysoconium</i> Berk. & Br. syn. <i>Rosellinia subiculata</i> (Schw.) Sacc.	<i>Hypoxylon</i> subsection Papillata
<i>Hypoxylon morgani</i> E. & E.	<i>Hypoxylon</i> subsection Papillata
<i>Penzigia bermudensis</i> Miller	<i>Penzigia</i>
<i>Penzigia cantareirensis</i> (Henn.) Mill.	<i>Penzigia</i>
<i>Penzigia citrina</i> (Shear) Mill.	<i>Penzigia</i>
<i>Penzigia discolor</i> (Berk. & Br.) Mill.	<i>Penzigia</i>

In *Hypoxylon chrysoconium* the yellow subiculum was mistaken by Miller for part of the stroma. *H. morgani* does not have a carbonaceous exterior and is pale in colour but, however, lacks an extractable pigment. In the four species of *Penzigia*, there is a white or brightly coloured basal tissue that is more prominent than in most members of *Primocinerea* but they are classified with them because the number of the perithecia per stroma are few, and the perithecia are evident in outline. They are somewhat intermediate with *Kretzschmaria* but are excluded because in typical members of *Kretzschmaria* some part of the stroma is usually sterile, comprising either a stipe or umbonate apex, and the perithecia are very rarely evident in outline.

For this same reason, one species, *H. cyclopicum* Speg. is excluded from the *Primocinerea* group where it was placed by Miller. It has a clear umbonate apex and the writer believes that the previous name *Kretzschmaria aggregata* (W. & C.) Sacc. is appropriate. Another species, *H. udum* Pers. ex Fr. should belong to the genus *Anthostomella* because the stroma is permanently immersed in the substrate. It is accordingly renamed now as *A. uda* (Pers. ex Fr.) Martin.

The writer proposes a new section of *Hypoxylon* to cover the species associated here. Sydow's genus *Entoleuca* (1922) is etymologically correct and thus considered the most appropriate, though it was only originally applied to one species, *E. callimorpha* Syd. [*Hypoxylon mammatum* (Wahl) Miller]. Miller's original section Papillata now comprises only the pigmented species therein, with simple papillate ostioles.

Key to the main species of the Section *Entoleuca* (Syd.) Martin sect. nov. and to other genera formerly confused with *Rosellinia*:

1.	Perithecia naked, not enclosed in a stroma though sometimes covered with a mycelial felt	2
1'	Perithecia enclosed in a definite crustose stroma (<i>Rosellinia</i> & <i>Hypoxylon</i>)	16
2.	Perithecia basally immersed, only vertices projecting; spores $8.0-11.0 \times 17.5-19.0\mu^*$ <i>Amphisphaerella amphisphaerioides</i> (Sacc. & Speg.) Kirschst. syn. <i>Rosellinia amphisphaerioides</i> Sacc. & Speg.	
2'	Perithecia densely aggregated, erumpent; spores $4.5 \times 6.5\mu$ <i>Cucurbitula myricaria</i> Fuckel syn. <i>Rosellinia myricaria</i> (Fuckel) Sacc.	
2''	Perithecia superficial	3
3.	Perithecia glabrous (<i>Coniomela</i>)	4
3'	Perithecia setose (<i>Hepminthosphaeria</i> (<i>Coniochaeta</i>))	13
4.	Perithecia seated on sparse basal subiculum	5
4'	Perithecia without subiculum	6
5.	Subiculum fawn grey with pronounced sandy appearance; spores $6.5 \times 10.0\mu$ <i>Coniomela substromatica</i> (E. & E.) Kirschst. syn. <i>Rosellinia substromatica</i> E. & E.	
5'	Subiculum grey black, closely appressed and smooth; spores $7.0 \times 11.5\mu$ <i>Coniomela parasitica</i> (E. & E.) Kirschst. syn. <i>Rosellinia parasitica</i> E. & E.	
6 (4)	Spores with curved beaks, $6.5 \times 14.0\mu$ <i>Coniomela rhyncospora</i> (Hark.) Kirschst. syn. <i>Rosellinia rhyncospora</i> Harkness	
7.	Spores appendiculate, $10.5 \times 15.5\mu$ <i>Coniomela compressa</i> (E. & D.) Kirschst. syn. <i>Rosellinia compressa</i> Ellis	
7'	Spores not appendiculate	8
8.	Spores with fine reticulate wall sculpturing, $10.5 \times 18.0\mu$ <i>Coniomela fibriseda</i> (E. & E.) Kirschst. syn. <i>Rosellinia fibriseda</i> E. & E.	
8'	Spore wall smooth	9
9.	Ostioles very prominent, often beak-shaped, asci thick walled, spores $21.0 \times 36.6\mu$ <i>Coniomela ostiolata</i> (E. & E.) Kirschst. syn. <i>Rosellinia ostiolata</i> E. & E.	
9'	Ostiole clearly though minutely papillate	10
9''	Ostiole not clearly visible, at stroma level	11
10.	Spores $5.0 \times 14.5\mu$ <i>Coniomela callimorphoides</i> (Rehm) Kirschst. syn. <i>Rosellinia callimorphoides</i> Rehm	
10'	Spores $9.0-10.0 \times 19.0-19.5\mu$ <i>Coniomela dispersella</i> (Nyl.) Kirschst. syn. <i>Rosellinia dispersella</i> (Nyl.) Karst.	
11 (9)	Perithecia reddish brown, spores $7.5 \times 10.0\mu$ <i>Coniomela rhodomela</i> (Schw.) Kirschst. syn. <i>Rosellinia rhodomela</i> (Schw.) E. & E.	
11'	Perithecia black	12
12.	Perithecia globose, $100-200$ diam., on pine; spores $4.0 \times 7.5\mu$ <i>Coniomela pinicola</i> (E. & E.) Kirschst. <i>Rosellinia pinicola</i> E. & E. (ined.?)	
12'	Perithecia globose to ovate, $100-200\mu$, on various hosts; spores variable $5.5-9.0 \times 9.0-14.5\mu$ <i>Coniomela millegrana</i> (Schw.) Kirschst. syn. <i>Anthostoma lambottiana</i> Faut. <i>Rosellinia millegrana</i> (Schw.) Sacc.	

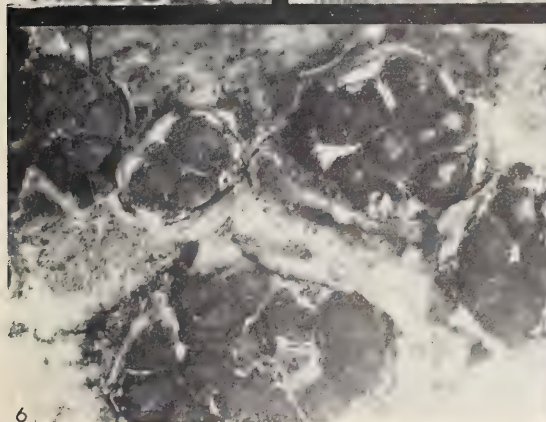
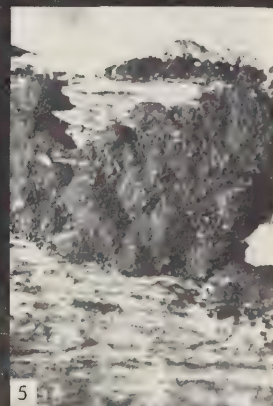
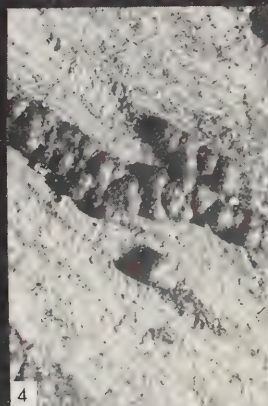
* Figures expressed to the first place of decimals represent averages of a set of measurements; integers only, the mere range of dimension.

- R. bigeloviae* E. & E.
R. caespitosa E. & E.
R. librincola Karst.
R. ovalis (Ell.) Sacc.
R. pulveracea (Ehr.) Fckl.
R. rimincola Rehm
R. rosarum Nissl.
R. sarothamni Schrot.
R. stigma E. & E. (ined.?)
R. subcorticalis Fckl.
- 13 (3) Perithecia seated on a sparse brown subiculum, irregular in distribution;
spores $5.0 \times 8.5 \mu$
Helminthosphaeria (Coniochaeta) *muriculata* (E. & E.)
Kirschst.
Rosellinia muriculata E. & E.
13. Subiculum absent 14
14. Shape of stroma ovoid, with rather wide truncate ostiole bearing a
characteristic frings of setose hyphae; spores $10.0 \times 14.5 \mu$
Helminthosphaeria (Coniochaeta) *niesslii* (Awd.) Kirschst.
syn. *Rosellinia niessli* Auerswald
- 14' Setae basally attached or covering entire ascocarp; ostioles indistinct
and not truncate 15
15. Spores oval, $5.0 \times 7.0 \mu$; 1-celled
Helminthosphaeria (Coniochaeta) *velutina* (Fckl.) Kirschst.
syn. *Rosellinia velutina* Fckl.
R. ebulii Rehm
R. hystrix E. & E.
R. kellermanii E. & E.
- 15' Spores variable, $6.0-9.5 \times 10.0-15.5 \mu$; 1-celled.
Helminthosphaeria (Coniochaeta) *lignaria* (Grev.) Kirschst.
syn. *Rosellinia lignaria* (Grev.) Fckl.
R. abietina Fuckel
R. arctaspora Cke. & Ellis
R. ambigua Sacc.
R. malacotricha Niessl
R. sordaria (Fr.) Rehm
R. xylariaespora Cke. & Ellis
- 15'' Spores elliptic; 2-celled, $7.5-8.0 \times 17.5-19.0 \mu$
Helminthosphaeria (Coniochaeta) *clavariae* (Tul.) Fckl.
syn. *Rosellinia clavariae* Desm.
- 16 (1) Subiculum absent 17
16' Subiculum present 75
17. Perithecial outlines hemispheric, ovoid or globose, or rarely with conic
vertices on globose bases 21
17' Perithecial outlines sharply conic in outline, sometimes compressed .. 18
18. Stromata multiperitheciate, pulvinate, spores $9.3 \times 25.0 \mu$
Hypoxylon cerebrinum (Fée) Cke.
- 18' Stromata mainly uniperitheciate 19
19. Stromata basally immersed in the substrate; spores elliptic, inequilateral
convex, $13.5 \times 38.0 \mu$
Hypoxylon poliosum (E. & E.) Martin
syn. *Rosellinia poliosa* E. & E.
- 19' Stromata superficial, spores crescentic 20
20. Spores $6.5-11.0 \times 30.0-34.5 \mu$
Hypoxylon bresadolae (Theiss.) Martin
syn. *Rosellinia bresadolae* Theiss.
- 20' Spores $10.0 \times 50.5 \mu$
Hypoxylon lamprostomum (Syd.) Martin
syn. *Rosellinia lamprostoma* Syd.

21 (17)	Outer layer scabrous or plainly verrucose at maturity	22
21'	Outer layer smooth or minutely verrucose at maturity, though sometimes white and scaly when young; continuous, or worn off at random. .	32
22.	On leaves of palm; stromata containing one or a few perithecia and distinctly verrucose; spores $8.0 \times 19.5\mu$	
	<i>Hypoxylon folicola</i> Miller	
22'	On dead stems	23
23.	Stromata mainly uniperitheciate	24
23'	Stromata mainly multiperitheciate	25
24.	Stromata globose, $1500-1880\mu$ diam. aggregated; spores $4.5 \times 10.5\mu$	
	<i>Hypoxylon megalocarpum</i> (Plow.) Martin	
	syn. <i>Rosellinia megalocarpa</i> (Plow.) Sacc.	
24'	Stromata ovoid, $1500-200\mu$ diam., not aggregated; spores $13.5 \times 34.0\mu$	
	<i>Hypoxylon tassianum</i> (C & DN) Martin	
	syn. <i>Rosellinia tassiana</i> C & DN.	
25 (23)	Initial layer dull yellow, later brown, conspicuous; ostioles truncate; spores $12.0-12.5 \times 24.5-29.5\mu$	
	<i>Hypoxylon quisquiliarum</i> Mont.	
25'	Initial layer otherwise coloured, ostioles not truncate	26
26.	Spores over 30μ long	31
26'	Spores under 30μ	27
27.	Stromata erumpent, usually gregarious, $1-5$ peritheciate; spores $12.0 \times 24.0\mu$	
	<i>Hypoxylon rosellinioides</i> Henn.	
27'	Stromata superficial	28
28.	Germ slits spiral	29
28'	Germ slits straight or slightly undulate	30
29.	Stromata aplanate, bearing gregarious perithecia evident in outline; basal tissues white; spores $6.5 \times 16.5\mu$	
	<i>Hypoxylon entoleucum</i> Martin nov. sp.	
29'	Stromata pulvinate, perithecia vaguely evident or immersed, basal tissue white, spores $9.5 \times 18.0\mu$	
	<i>Hypoxylon cadigensis</i> Yates	
30 (28)	Stromata globose to pulvinate; spores $6.5 \times 11.0\mu$; basal tissue saffron	
	<i>Hypoxylon discolor</i> B. & Br.	
	syn. <i>Penzigia discolor</i> (B. & Br.) Mill.	
30'	Stromata aplanopulvinate; spores $7.5-8.5 \times 26.0-28.0\mu$; basal tissue dull white to cream	
	<i>Hypoxylon cantareirens</i> Henn.	
	syn. <i>Penzigia cantareirens</i> (Henn.) Miller	
31 (26)	Stromata semiglobose or depressed, $2-4$ cm in diam.; spores $15-18 \times 45-60\mu$	
	<i>Hypoxylon nucigenum</i> Henn.	
31'	Stromata globose with areolate-tuberculate surface; $1-3$ cm in diam., spores $14-21 \times 50-60\mu$	
	<i>Hypoxylon fragaria</i> Ces.	
32 (21)	Stromata erumpent or superficial by attrition of substrate and with base still immersed	33
32'	Stromata superficial or apparently so	42

PLATE I.

1. *Coniomela millegrana*; gregarious perithecia ($\times 2.8$).
2. *Hypoxylon mastoideum* (*Rosellinia mammoidea*); Young stromata with scabrous ectostroma and white conidial layer ($\times 2.8$).
3. *Hypoxylon serpens*; uniperitheciate stromata ($\times 2.8$).
4. *Hypoxylon serpens*; uniperitheciate and multiperitheciate stromata ($\times 2.8$).
5. *Hypoxylon serpens*; multiperitheciate stromata ($\times 2.8$).
6. *Hypoxylon mammatum*; pulvinate stromata with evident perithecia and remains of white ectostroma ($\times 3$).
7. *Hypoxylon mammatum*; effuse stromata with perithecial submersion ($\times 3$).



33. Uniperitheciate stromata common; basal tissue slight 34
 33' Uniperitheciate stromata rare; basal tissue well developed, dull or bright coloured 37
 34. Substrate splits to form stellate lobes around the base of the stroma; stromata mainly uniperitheciate; spores $6.0-6.5 \times 12.0\mu$; on monocotyledons
 Hypoxylon geasteroides (E. & E.) Martin
 syn. *Rosellinia geasteroides* E. & E.
 R. bambusae Henn.
 Anthostomella mirabilis (B. & Br.) v. Hoehn
 34' Substrate worn off at random, stroma clearly exposed 35
 35. Upper surface of the stroma shiny, vertices of the perithecia usually conic, sometimes with a circular indentation corresponding to the removal of the outer layer; on dicotyledonous hosts; spores $5.0 \times 10.5\mu$
 Hypoxylon ravenelii Rehm
 syn. *Rosellinia formosa* Penz. & Sacc.
 35' Upper surface of the stroma dull; perithecial vertices ovoid or hemispheric without indentation 36
 36. On monocotyledonous hosts and predominantly uniperitheciate; spores $6.5 \times 17.0 \times 18.5\mu$
 Hypoxylon sublimbatum (D. & M.) Martin
 syn. *Rosellinia sublimbata* (D. & M.) Pass.
 R. cocoes Henn.
 Anthostomella arengae (Racib.) Rehm
 36' On dicotyledonous hosts and predominantly with more than one perithecium per stroma; stroma basally immersed only; spores $7.0-8.5 \times 14.5-16.5\mu$
 Hypoxylon confluens (Tode ex Fr.) West
 37 (33) Spores inequilateral, with spiral germ slits, $7.5 \times 21.0\mu$; stromata globose to hemispheric, constricted below
 Hypoxylon conostomum Mont.
 37' Spores equilateral, germ slits straight 38
 38. Ostioles papillate, stroma evenly attached 39
 38' Ostioles raised, poroid, spores $16-24 \times 30-40\mu$; stroma constricted at the base, semiglobose to urceolate
 Hypoxylon megalosporum Speg.
 39. Stroma pulvinate or aplanopulvinate, perithecia clearly distinct, one to many per stroma; ostioles papillate to spout-shaped; spores elliptic to cylindric, $8.0-11.0 \times 18.0-26.5\mu$
 Hypoxylon mammatum (Wahl.) Miller
 39' Stroma subglobose to pulvinate, perithecia immersed, one to few per stroma, ostioles minutely papillate to indistinct or umbilicate 40
 40. Interior of stroma tinted yellow or yellow-orange; ostioles indistinct or poroid, sometimes with conspicuous periphysate mouths; spores cylindric to elliptic, $3.5-4.0 \times 10.0-12.0\mu$
 Hypoxylon sassafras (Schw. ex Fr.) Curt.
 40' Interior of stroma white or dull brown; ostioles indistinct or papillate; spores elliptic or oval 41
 41. Spores $4.5 \times 9.5\mu$
 Hypoxylon laurus Miller

PLATE II.

1. *Hypoxylon corticium* (*Rosellinia corticia*); ascus with apical amyloid plug. ($\times 440$).
- 2, 3. Front and side views of the same, enlarged ($\times 940$).
4. *Hypoxylon serpens*; developing ascus with plug. ($\times 940$).
5. *Hypoxylon serpens*; ascus dehiscing, with plug displaced to one side ($\times 940$).
6. *Hypoxylon mammatum*; conidiophores. ($\times 660$).
7. *Hypoxylon serpens*; conidiophores ($\times 660$).



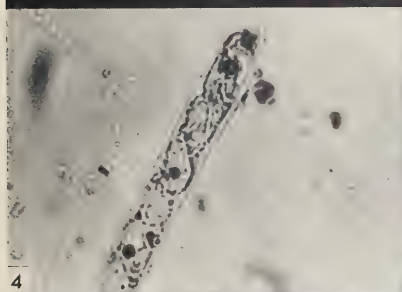
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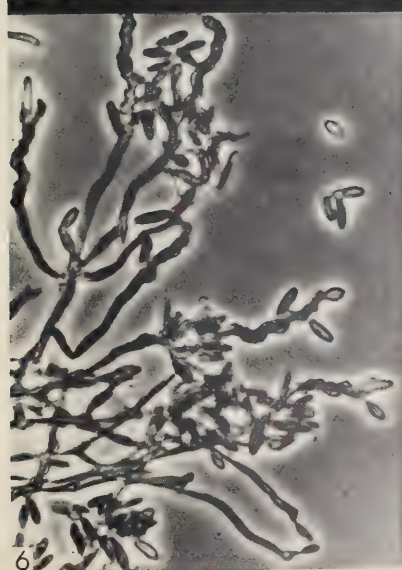
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6



7

- 41' Spores $9.0 - 12.0 \times 19.0 - 23.6\mu$
Hypoxylon quadratum (Schw.) E. & E.
 syn. *Hypoxylon regale* Morgan
- 41'' Spores $14 - 20 \times 25 - 40\mu$
Hypoxylon sphaerostomum (Schw.) Sacc.
- 42 (32) Spores exceeding 40μ in length 43
 42' Spores not above 30μ in length 45
43. Stroma spherical with narrow point of attachment; spores $7.5 \times 67.5\mu$
Hypoxylon giganteum (E. & E.) Martin
 syn. *Rosellinia gigantea* E. & E.
- 43' Stroma ovoid to globular 44
 44. Spores $15.0 \times 56.0\mu$
Hypoxylon horridum (Rehm) Martin
 syn. *Rosellinia horrida* Rehm
- 44' Spores $14.0 \times 88.0\mu$
Hypoxylon megalospermum (Syd.) Martin
 syn. *Rosellinia megalosperma* Syd.
- 45 (42) Stromata uniperitheciate with globose base and conical vertex; ostiole very prominent; spores $7.5 \times 16.5\mu$
Hypoxylon albolanatum (E. & E.) Martin
 syn. *Rosellinia albolanata* E. & E.
- 45' Stroma globose, ovoid or aplanate; one to several perithecia per stroma 46
 46. Stroma basally immersed in the substrate; spores $7.0 - 8.5 \times 14.5 - 16.5\mu$
Hypoxylon confluens (Tode. ex Fr.) West
- 46' Stromata entirely superficial 47
 47. Stromata carbonaceous and black at maturity 48
 47' Stromata dull yellow brown, corky throughout; spores navicular to crescentic, beaked, $14.0 \times 42.0\mu$
Hypoxylon morgani E. & E.
48. Basal tissue white and clearly developed 49
 48' Basal tissue not clearly developed, dull white to brown 51
 49. Perithecia one to a few per stroma, immersed; spores inequilateral with proximal end narrower than distal, $5.0 \times 11.5\mu$
Hypoxylon cuneosporum Martin nov. sp.
- 49' Perithecia evident, spores with identical ends: stroma attached at central point 50
 50. Basal tissue corky and white; spores $6.5 \times 9.0\mu$
Hypoxylon bermudensis (Mill.) Martin
 syn. *Penzigia bermudensis* Miller
- 50' Basal tissue corky, saffron; spores $7.5 \times 10.5\mu$
Hypoxylon citrinum Shear
 syn. *Penzigia citrina* (Shear) Miller
- 51 (48) Stromata mainly uniperitheciate, or uniperitheciate stromata commonly present 52
 51' Stromata mainly multiperitheciate, or uniperitheciate stromata uncommon 64
 52. Stromata minute, $200 - 300 \times 150\mu$; spores $6.0 \times 8.5\mu$
Hypoxylon minutissimum Martin nov. sp.
- 52' Stromata with relatively small perithecia not exceeding $1,000\mu$, and usually less than 700μ diam. 53
 52'' Stromata with relatively large perithecia, at least 600μ and usually exceeding $1,000\mu$ diam. 60
 53. Stromata dull and minutely verrucose; spores with short linear germ slits, $5.5 - 8.0 \times 15.0 - 19.0\mu$
Hypoxylon glandiformis (E. & E.) Martin
 syn. *Rosellinia glandiformis* E. & E.
- 53' Stromata otherwise; germ slits elongate 54
 54. Outer layer conspicuous, brown, granulate and contrasting with the black ostioles; spores with spiral germ slits; $7.0 - 8.0 \times 24.5 - 27.0\mu$
Hypoxylon medullaris (Wallr.) Martin

- syn. *Rosellinia medullaris* (Wallr.) C. & DN
R. subsimilis Sacc.
54' Outer layer not conspicuous or worn off irregularly, dark brown to black, sometimes shiny; germ slits straight .. 55
55. Spores appendiculate with short hyaline appendages $4.5 \times 9.0 \mu$..
syn. *Hypoxylon apiculatum* (Sacc.) Martin
syn. *Rosellinia apiculata* Sacc.
55' Spores without appendages 56
56. Spores mucronate, oval, black, $7.0-8.5 \times 13.5-15.0 \mu$
syn. *Hypoxylon limoniisporum* (E. & E.) Martin
syn. *Rosellinia limoniispora* E. & E.
56' Spores not mucronate 57
57. Perithecial outline hemispheric 58
57' Perithecial outline globose 59
58. Spores $4.5 \times 8.5 \mu$
syn. *Hypoxylon langloisii* (E. & E.) Martin
syn. *Rosellinia langloisii* E. & E.
58' Spores $6.0 \times 9.5 \mu$
syn. *Hypoxylon subacutum* (Schw.) Martin
syn. *Rosellinia subacuta* (Schw.) Sacc.
58'' Spores $5.0 \times 12.5 \mu$
syn. *Hypoxylon ludovicianum* (Ellis) Martin
syn. *Rosellinia ludoviciana* Ellis
59 (57) Stromata not aggregated, spores $6.5 \times 10.5 \mu$
syn. *Hypoxylon mutans* (Cke. & Pk.) Martin
syn. *Rosellinia mutans* (Cke. & Pk.) Sacc.
59' Stromata densely gregarious to aggregated or in small clusters, usually shiny; spores $5.0 \times 9.5 \mu$
syn. *Hypoxylon perusensis* (Henn.) Martin
syn. *Rosellinia perusensis* Henn.
60 (52) Base of stroma usually adnate to or partly enclosed by the substrate; if not adnate, then spores small in size 61
60' Base of stroma narrow; not adnate to the substrate; spores large, $7.5 \times 19.4-10.0 \times 26.5 \mu$
syn. *Hypoxylon corticium* (Schw.) Martin
syn. *Rosellinia corticia* (Schw.) Sacc.
61. Spores equilateral 62
61' Spores inequilateral 63
62. Spores $4.5 \times 8.0 \mu$
syn. *Hypoxylon victoriae* (Syd.) Martin
syn. *Rosellinia victoriae* Syd.
62' Spores $6.4 \times 11.5 \mu$
syn. *Hypoxylon protuberans* (Karst.) Martin
syn. *Rosellinia protuberans* (Karst.)
62'' Spores $7.0-8.5 \times 13.5-17.0 \mu$
syn. *Hypoxylon mastoideum* (Fr.) Martin
syn. *Rosellinia mastoidea* (Fr.) Sacc.
62''' Spores $12.5 \times 23.0 \mu$
syn. *Hypoxylon julii* (Fab.) Martin
syn. *Rosellinia julii* Fab.
63 (61) Spores $4.5 \times 9.5 \mu$
syn. *Hypoxylon callimorphum* (Karst.) Martin
syn. *Rosellinia callimorpha* Karst.
63' Spores $5.0-6.0 \times 11.0-17.0 \mu$
syn. *Hypoxylon serpens* (Pers. ex Fr.) Kickx
syn. *Hypoxylon caries* (Schw.) Sacc.
63'' Spores $6.5-9.0 \times 21.5-26.5 \mu$
syn. *Hypoxylon mammiformis* (Pers.) Martin
syn. *Rosellinia mammiformis* (Pers.) C. & DN.

64 (51)	Stromata on coniferous substrate	65
64'	Stromata on monocotyledonous substrate	66
64''	Stromata on dicotyledonous substrate	68
65.	Stromata on coniferous needles on the ground, aplanopulvinate; spores 6-7.5 × 12-17μ	
	<i>Hypoxylon terricola</i> Miller	
65'	Stromata on coniferous wood, pulvinate; spores 11.5 × 25.0 -12.0 × 29.0μ	
	<i>Hypoxylon diathrauston</i> Rehm	
	syn. <i>Creosphaeria pinea</i> Petrak	
66 (64)	Stromata on bamboo culms	67
66'	Stromata on <i>Smilax</i> stems, spores 6.0-8.0 × 14.5-16.5μ	
	<i>Hypoxylon smilacicum</i> Howe	
67.	Spores 7.0 × 18.0μ	
	<i>Hypoxylon culmorum</i> Cke.	
67'	Spores 8-12 × 18-27μ	
	<i>Hypoxylon nummularioides</i> Rehm	
68 (64)	Stromata small, discrete, up to 5 mm long; spores 7.0-8.5 × 14.5- 16.5μ	
	<i>Hypoxylon confluens</i> (Tode ex Fr.) West	
68'	Stromata effuse, aplanopulvinate	69
69.	Stroma emarginate, closely adnate to the bark, spores 6.0 × 9.0μ	
	<i>Hypoxylon grandineum</i> (Berk. & Rav.) Mill.	
69'	Stroma with definite circumscribed margin	70
70.	Spores amber coloured to pale brown	71
70'	Spores dark coloured	72
71.	Ascospores oval to elliptic, 5.0-6.0 × 11.0-17.0μ	
	<i>Hypoxylon serpens</i> (Pers. ex Fr.) Kickx	
	syn. <i>Hypoxylon caries</i> (Schw.) Sacc.	
71'	Ascospores narrow elliptic, navicular to crescentic, 4.0 × 11.5μ	
	<i>Hypoxylon illitum</i> (Schw.) Curt.	
72 (70)	Stromata well developed, but with outer layer smooth, dull	73
72'	Stromata massive with outer layer wrinkled or uneven, shiny; spores inequilateral, 5.5 × 13.0μ	
	<i>Hypoxylon adumbratio</i> Martin nov. sp.	
73.	Perithecia evident in outline, usually globose; spores inequilateral, sometimes appendiculate, 11.5 × 25.0-12.0 × 29.0μ	
	<i>Hypoxylon diathrauston</i> Rehm	
73'	Perithecia usually immersed or only vaguely evident; spores equilateral without appendages	74
74.	Spores 4.5-6.0 × 10.0-12.5μ	
	<i>Hypoxylon albocinctum</i> E. & E.	
74'	Spores larger, 6-14 × 14-40μ	
	<i>Hypoxylon pyraerthii</i> Bres.	
75 (16)	Subiculum of matted hyphae, coarse, dark brown	76
75'	Subiculum of closely anastomosed and crustose hyphae, fine granulate to waxy, light coloured	86
76.	Stroma containing several loosely associated perithecia, aplanopulvinate; spores appendiculate at maturity, later appendages dissolve away; spores 6.5 × 14.0μ	
	<i>Hypoxylon rostrispora</i> (Ger.) Martin	
	syn. <i>Anthostomella rostrispora</i> (Ger.) Sacc.	
76'	Stroma containing one or a few perithecia	77
77.	Spores with hyaline appendages; ends of spores usually conspicuously truncate	78
77'	Spores without appendages, ends broad or narrow rounded	80
78.	Appendages short, ovoid, spores 8.0 × 20.5μ	
	<i>Hypoxylon aquilum</i> (Fr.) Mart.	
	syn. <i>Rosellinia aquila</i> (Fr.) DN.	
78'	Appendages long, acuminate or acute	79

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| 79. | Subiculum loosely woven, light brown, spores $6.0 \times 17.5\mu$
<i>Hypoxylon pulcherrimum</i> (E. & E.) Martin
syn. <i>Rosellinia pulcherrima</i> E. & E. | |
| 79' | Subiculum dense, dark brown; spores $8.0 \times 24.0\mu$
<i>Hypoxylon thelenum</i> (Fr.) Martin
syn. <i>Rosellinia thelena</i> (Fr.) Rabh. | |
| 80 (77) | Spores produced into a fine curled tip at both ends; $11.5 \times 101.5\mu$
<i>Hypoxylon bunodes</i> (B. & Br.) Martin
syn. <i>Rosellinia bunodes</i> (B. & Br.) Sacc. | |
| 80' | Spores sometimes acuminate but not produced | 81 |
| 81. | Perithecia not more than $1,200\mu$ diam. | 82 |
| 81' | Perithecia exceeding $1,200\mu$ diam. | 83 |
| 82. | Spores $7.5 \times 16.0\mu$
<i>Hypoxylon truncatulum</i> Martin nov. comb.
syn. <i>Rosellinia truncata</i> Syd. | |
| 82' | Spores $8 \times 30\mu$; species parasitic on <i>Quercus</i>
<i>Hypoxylon quercinum</i> (Hart.) Martin
syn. <i>Rosellinia quercina</i> Hart. | |
| 82'' | Spores $13.0 \times 33.0-34.5\mu$
<i>Hypoxylon acuminosporum</i> Martin nov. comb.
syn. <i>Rosellinia merrillii</i> Syd. | |
| 82''' | Spores $8.0 \times 50.0\mu$
<i>Hypoxylon asperatum</i> (Massee) Martin
syn. <i>Rosellinia asperata</i> Massee | |
| 82'''' | Spores $11.5 \times 75.0\mu$
<i>Hypoxylon gigasporum</i> (E. & E.) Martin
syn. <i>Rosellinia gigaspora</i> E. & E. | |
| 83 (81) | Spores pale brown to amber, elliptic, $7.0 \times 18.5\mu$
<i>Hypoxylon aridicolum</i> Martin nov. sp. | |
| 83' | Spores dark brown, usually opaque, variously shaped | 84 |
| 84. | Conidial stage on a <i>Graphium</i> -type coremium | 85 |
| 84' | Conidial stage hyphomycetous; spores oval elliptic, rather broad, inequilaterally convex, $7.5 \times 19.5-10.0 \times 26.5\mu$
<i>Hypoxylon corticium</i> (Schw.) Martin
syn. <i>Rosellinia corticia</i> (Schw.) Sacc.
<i>R. megaloeia</i> E. & E. | |
| 85. | Ascospores $8.0 \times 24.5\mu$
<i>Hypoxylon buxi</i> (Fabre) Martin
syn. <i>Rosellinia buxi</i> Fabre | |
| 85' | Ascospores $13.0 \times 34.5\mu$
<i>Hypoxylon radiciperdatum</i> (Massee) Martin
syn. <i>Rosellinia radiciperda</i> Massee | |
| 85'' | Ascospores $7.0 \times 38.0\mu$
<i>Hypoxylon necatrix</i> (Hart.) Martin
syn. <i>Rosellinia necatrix</i> (Hart.) Berl. | |
| 85''' | Ascospores $5-7 \times 40-47\mu$
<i>Hypoxylon Gothrinum</i> (B. & Br.) Martin
syn. <i>Rosellinia Gothrina</i> (B. & Br.) Sacc. | |
| 86 (75) | Subiculum pale cream to yellow | 87 |
| 86' | Subiculum fawn white, stromata usually 4 15 peritheciate, spores $7.0 \times 14.5\mu$
<i>Hypoxylon subaenum</i> (B. & C.) Martin
syn. <i>Rosellinia subaena</i> (B. & C.) Sacc. | |
| 86'' | Subiculum white, stromata uniperitheciate, on living conifer leaves, spores $9.0 \times 24.0\mu$
<i>Hypoxylon herpotrichioides</i> (Hept. & Dav.) Mart. | |
| 87. | Ectostroma brown, perithecia globose | 88 |

- 87' Ectostroma black, perithecia hemispheric; spores $5.5-6.5 \times 10.0-11.5\mu$
Hypoxyton chrysoconium B. & Br.
 syn. *Rosellinia subiculata* (Schw.) Sacc.
88. Spores $9.0 \times 24.0\mu$
Hypoxyton bicoloratum Martin nov. comb.
 syn. *Rosellinia bicolor* E. & E.
- 88' Spores $6.3 \times 10.0\mu$
Hypoxyton griseocinctum (Starb.) Mart.
 syn. *Rosellinia griseocincta* Starb.

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